Session 4B: Shoreline Modifications

Questions & Answers

Jim Johannessen
Q: What is the minimum width that you need to work in?

A: It all depends. If you have a higher energy shore in general, you will need a little more room. Some of these have been designed to stay above mean higher high water to keep the beach impacts down. So that you would need, some of those ones that I showed at the end were 20-25 feet wide, for example.

Q: What is the cost?

A: [For one complicated project, the] total cost in the end was about $200,000. It was almost 900 feet so you come out to around $200 a foot. It would have been a lot less if we had better access, and it's still similar to new bulkhead construction at that cost. [Another example] was only about, to build it, was about $8,000. So in that case, you are below bulkhead cost. The Maxwelton Beach was below a new bulkhead cost as well.

Q: Where are you obtaining the gravel from?

A: They are from approved upland pits. So you could say, "Well there are impacts to that," but they are from approved pits. They are not from beach sources; they are not from off shore. In many other parts of the world they do mine offshore. That doesn't seem to be a very popular idea around here, but I don't think it's been pursued very much either.

Elliott Menashe
Q: Have you used cord rugs on the shoreline?

A: There are a multiplicity of new generation geotextile fabric and constructions that can be used in a specific site, and yes we have used those in very low energy beaches, and that would be more than an adjunct to the type of thing that Jim does. But if you have the natural materials, drift log works just as well, and it's a lot cheaper. The good point about that is that you can vegetate that log structure, and this is a good point, the persistence of the material, when I first started this I tried to use the all natural material jute. Jute is great, it rots really quick, and it's found to be most effective where it's least needed. So, if you have an erosion problem, you want a material that will persist long enough for establishment.

Q: Are the plants used native, and are they native to the specific area of the project?

A: Yes. There's at least 100 valuable erosion control species in the northwest and they have an amazing variability and variety and for any given situation. You may be down to a pallet of maybe four or five of the basic erosion control or slope stabilizing plants, and, whenever possible, you should use materials that are native to that specific are. And if you are lucky enough to have a lead time, actually have plants propagated from the area, but usually only the park service can afford that.

Q: Are there places updrift where there is a lot of erosion where what I'm getting is (a) should you be stabilizing it, wouldn't that be similar to a bulkhead and (b) aren't you offering landowners a false sense of security?

A: There are definitely places where neither vegetation nor anything else is going to be effective, there are places where vegetation alone is not going to be effective, and there are places that a combination will not be effective. There are places that should never have been built on, but this process is only for a band of possibilities, and it's a site-by-site situation, and you have to use common sense and judgment and look at the surrounding areas before you determine this is an approach you want to take. The other part of that is

that, this is not designed to stop erosion, this is not designed to end all movement and make the shoreline static. It's giving the shoreline that has been disturbed a chance to reestablish a developing and adapting and self-perpetuating plant community that will reduce erosion to an acceptable level. There's all kind of drainage things and setback things that need to be used in conjunction with any kind of stabilization.

Hugh Shipman
[Question not recorded.]

A: I think a lot of these projects actually had multiple benefits. I think that the common characteristic of most of these projects is that they restore or enhance to some degree the upper intertidal. Usually, because the upper intertidal has been lost or progressively eroded away, sometimes in front of an old structure, and simply the enhancement of the upper intertidal brings a hope in these park settings that obviously has a huge public benefit to it. We show people what a beach is supposed to look like, not just something they can dangle over and watch high tide. But we are also obviously recreating the conditions at least, it may not be forcing the smelt to lay their eggs, but we are creating an environment, for example, maybe more attractive or maybe more successful from a spawning perspective because we are putting finer grain material back higher on the profile. I don't think we understand yet why smelt are going to go to one beach or another and whether they are going to avoid some proje, but I think we have got evidence of smelt on some of these beaches since after nourishment they clearly provide erosion protection, just like natural beaches, a healthy natural beach basically keeps the waves from the toe of the bank or keeps it from going over the top. They are providing erosion protection, obviously from a property owner proponent's perspective, engineering consultant's perspective, that's probably the highest priority, and usually the reason the project came up in the first place was that they wanted to somehow protect something that was at risk. And these projects can be very effective at that, they don't provide the same certainty, and it's a little harder for an engineer to sign off on the designs, it's difficult. They do provide that as a benefit as well. I think one of the reasons nourishment has been successful is that it provides more than one thing.

[Question not recorded.]

A: In a regulatory system that's set up, basically. So it's great if you just want to come in once and do something but it's not very good if you want to come back in five or ten years. Lincoln Park is a good example, where nourishment was approved but the process five years later to do re-nourishment was almost as nasty and convoluted as the initial process. The answer is no, there's not a structure to do that. I've seen efforts in the initial permitting to call attention to the fact that re-nourishment is anticipated and that makes it a lot easier for a proponent to come in later on and say we knew this was going to happen. Especially if there's monitoring tied to it, you can come in and say we knew this would happen, this is what we plan to do, it may be easier to get through the process at that point and maybe that brings up the monitoring aspect. I think that one of the things I like to hold out to a proponent is if you can monitor this project you're going to be in much better shape when it comes time to re-nourish this project because you're going to be able to tell us why you need to re-nourish and you'll be able to convince us that you've got a good design for doing the re-nourishment and making it work, maybe better this time, and you can tell us something about what the impacts were or weren't in the initial project. That is one of the strong reasons for trying to get monitoring on more of these projects, is to ensure that on well-conceived projects that re-nourishment can occur without requiring everyone to go back to ground zero.

[Question not recorded.]

A: I think they are going to have to be just given the regulatory climate and all. That's a very good point, a lot of these projects look very nice but we don't have good ways to measure the effectiveness, but part of that is because we don't have, and this is maybe a challenge to the biologists, we don't have really good ways to assess the biology on a lot of these beaches, natural or modified. We don't know much about them, and the methods and techniques are tough. Monitoring is very easy for those of us who are interested in watching physical profile changes, watching how volumes change, it tells us a lot about how the beach has gone up or down, or it's changed from sand to gravel, but if you are trying to measure epibenthic zooplankton, I'll tell you, I've seen how you have to deal with those critters and how fast they change from one sample to the next sample a week later, I'm not sure how you interpret the results, and at Lincoln Park

we had just a plethora of ambiguous biological results, and everyone interpreted them their own way. Even though an awful lot of effort was made to monitor the beach biologically, by some very competent people.

Another quick point on that one, a lot of these projects would have been bulkheads, especially a few years ago, some of them still may be, some of them are maintenance of existing bulkheads, and some would be bulkheaded even without a permit, in all reality in some cases.

Q: Did you or Hugh or Steve want to comment on the question that was raised after Elliott's talk about where these might be inappropriate where beach feeding is being cut off by them, feeder bluffs for example or feeder sources?

A: Several of us have argued for a long time that if you're goal is maintaining a sediment supply to a littoral cell, it doesn't matter how you stop the erosion, you're still having the same net effect. You are reducing the amount of sediment that's moving down drift, and it doesn't matter whether you are using biology or whether you are using tiered rockeries. The effect is largely the same on the sediment supply, and I think that's a very well taken point and I know we all want to go out there, especially those of us who have had go out and work with property owners, either as consultants or as regulators and tell people, yes, we can get you an alternative that's going to solve your problem—your nourishment will work for you, bioretention is going to solve your problem. But ultimately, in a lot of those cases, especially those folks that live on those rapidly eroding bluffs, where the risks are greater but where lots of sand and gravel are feeding their neighbor's beaches, we just have to come up with a better mechanism for saying no, in the first place, and not promising them sort of alternative that (1) may not work and (2) isn't going to actually going to make the problem any better.

Yes, that is a tough one to generalize. In many cases, one of the main reasons why that we see most of these projects on no-bank environments is because the people there are more attached to the beach. It's a psychological thing. They see the beach, they know the beach, they love the way the beach used to be and they value it, and when they are up on the bluff, most of those people hardly ever go to the beach from my experience. I think it's more of a psychological difference why we haven't done these, I think there are a lot of bluff properties where this could work and there is a lot of bluff properties [where it] wouldn't really be appropriate. There is no way we can give you that five-second answer. It depends on the geometry of the site, the wave energy of the site, the size of the site, the amount of erosion, the amount of adjacent structures, the bluff stratigraphy. There's a lot of issues, but I think there are some real applications, we just really haven't been there.

Q: Soft solution with plants can create the same problem that a bulkhead creates, so in the sense that it reduces the supply to the guys down drift are seeing the same effect whether it's a bulkhead or plant, and so the point is that is the big supply to the system, we have to consider the whole system, and you're right, each individual situation has to be looked at closely.

A: OK, I guess I need to address this. A couple of complaints: (1) the solution that I have said is a possibility on various sites would not be considered on those vertical 400, 200 foot sand bluffs that are obviously feeding the littoral drift. It's not an option. Where this would be appropriate is areas that have for whatever reason, through natural processes or human processes, accelerated erosion has created an area that has suffered severe surface erosion and gullying, shallow mass soil movement down to about 12 feet that used to be wooded before the original forest was removed and over time. Those are the sites that I am talking about. That this would be appropriate for and there is a difference, I hate to not agree with Hugh, but they don't stop erosion, they meter erosion, they moderate the rate of erosion so you don't have one catastrophic loss and then a dearth of sediments. You have sediments in a natural system at a low rate that are always moving.